Abstract of the Disclosure

An engine misfire detection system includes a database of engine fingerprints, each fingerprint corresponding to a known misfire condition. A technician uses software to compare the fingerprints in the database to an engine with a combustion inefficiency to determine which cylinder in the engine has the combustion inefficiency. The fingerprints are generated by evaluating an output from a lambda sensor and a timing reference. An alternate embodiment associates oxygen sensors with each of the cylinders in the engine and infers combustion inefficiency when a given sensor detects a peak in the amount of oxygen.